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Date: February 4, 2009 Name: G. Peter Nichols Signature: /G. Peter Nichols/

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:
Froyland et al.

Group Art Unit: 2123

Appl. No.: 10/530,845

Examiner: Jacob

Filed: February 27, 2006

Confirmation No: 2461

For: SYSTEM AND METHOD(S) OF MINE PLANNING, DESIGN AND PROCESSING

Commissioner for Patents
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Alexandria, VA 22313-1450

Supplemental Amendment Pursuant to 37 CFR 1.312

Dear Sir:

In response to the Response to Rule 312 Communication mailed February 2, 2009, Applicants request entry of a proposed amendment to claim 85. Applicants apologize for any inconvenience caused by the submission of this paper.

Listing Of Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. to 68. (Canceled)

69. (Previously Presented) A method of determining extraction of material from a mine having at least one pit comprising:

receiving into a data processing system, a block model of the pit in which material is divided into a plurality of blocks;

processing, using the data processing system, the blocks of the block model based on at least one criteria to define a plurality of clusters each comprising a plurality of blocks;

forming, using the data processing system, a cone for each cluster propagating upwardly by precedence arcs extending from each cluster; and

defining, using the data processing system, clumps of material from the intersection of the cones, the clumps comprising volumes of material not crossed by precedence arcs, so that material is extractable from the mine in any extraction ordering of the clumps that is feasible according to the precedence arcs to provide flexibility in the extraction of the material from the mine.

70. (Previously Presented) The method according to claim 69 wherein the at least one criteria comprises spatial position of blocks relative to one another.

71. (Previously Presented) The method according to claim 70 comprising determining a time of extraction for the blocks.

72. (Previously Presented) The method according to claim 70 wherein at least one further criteria comprises a variable selected from the group comprising value of material, grade of material, and material type.

73. (Previously Presented) The method according to claim 72 further comprising increasing an emphasis of the further criteria so that clusters are formed from blocks which are more spatially fragmented but more closely follow an optimal extraction schedule.

74. (Previously Presented) The method according to claim 72 further comprising decreasing an emphasis of the further criteria so the clusters are formed from blocks which are spatially compact but ignore an optimal extraction sequence.

75. (Previously Presented) The method according to claim 69 wherein when the plurality of clusters has been defined, the clusters are ordered in time and the plurality of cones are propagated upwardly from each cluster in order of time, and wherein any blocks already assigned to a first cone are not included in a second cone or any subsequent cone, and any blocks assigned to the second cone are not included in any subsequent cone and so-on.

76. (Previously Presented) The method according to claim 69 wherein a size of each cluster is controlled to a predetermined size by reducing oversized clusters by reassigning blocks of that cluster according to their probability of belonging to other clusters.

77. (Previously Presented) An apparatus for determining extraction of material from a mine having at least one pit comprising:

a processor for receiving a block model of the pit in which material is divided into a plurality of blocks;

a memory for storing computer program code that, upon execution by the processor performs operations comprising:

processing the blocks of the block model based on at least one criteria to define a plurality of clusters each comprising a plurality of blocks;

forming a cone for each cluster propagating upwardly by precedence arcs extending from each cluster; and

defining clumps of material from an intersection of the cones, the clumps comprising volumes of material not crossed by precedence arcs, so that material is extractable from the mine in any extraction ordering of the clumps that is feasible according to the precedence arcs to provide flexibility in the extraction of the material from the mine

78. (Previously Presented) The apparatus according to claim 77 wherein the at least one criteria used to define each cluster comprises spatial position of blocks relative to one another.

79. (Previously Presented) The apparatus according to claim 78 wherein the processor is also for determining a time of extraction.

80. (Previously Presented) The apparatus according to claim 78 wherein at least one further criteria comprises a variable selected from the group comprising value of material, grade of material, and material type.

81. (Previously Presented) The apparatus according to claim 80 wherein an emphasis of the further criteria is increased so that clusters are formed from blocks which are more spatially fragmented but more closely follow an optimal extraction schedule.

82. (Previously Presented) The apparatus according to claim 80 wherein an emphasis of the further criteria is decreased so the clusters are formed from blocks which are spatially compact but ignore an optimal extraction sequence.

83. (Previously Presented) The apparatus according to claim 77 wherein the processor is also for, when the plurality of clusters has been defined, ordering the clusters in time and the plurality of cones are propagated upwardly from each cluster in order of time, and wherein any blocks already assigned to a first cone are not included in a second cone or any subsequent cone, and any blocks assigned to the second cone are not included in any subsequent cone and so-on.

84. (Previously Presented) The apparatus according to claim 77 wherein the processor is also for controlling a size of each cluster to a predetermined size by reducing oversized clusters by reassigning blocks of that cluster according to their probability of belonging to other clusters.

85. (Currently Amended) A computer readable medium having thereon computer program code which when executed by a processor determines extraction of material from a mine having at least one pit, the computer program code comprising:

code for ~~forming~~ receiving a block model of the pit in which material is divided into a plurality of blocks;

code for processing the blocks of the block model based on at least one criteria to define a plurality of clusters each comprising a plurality of blocks;

code for forming a cone for each cluster propagating upwardly by precedence arcs extending from each cluster; and

code for defining clumps of material from an intersection of the cones so that material is extractable from the mine in any extraction ordering of the clumps that is

feasible according to the precedence arcs to provide flexibility in the extraction of the material from the mine.

86. (Previously Presented) The computer readable medium according to claim 85 wherein at least one criteria used by the code to define each cluster comprises spatial position of blocks relative to one another.

87. (Previously Presented) The computer readable medium according to claim 86 comprising code for determining a time of extraction.

88. (Previously Presented) The computer readable medium according to claim 86 wherein at least one further criteria used by the code comprises a variable selected from the group comprising value of material, grade of material, and material type.

89. (Previously Presented) The computer readable medium according to claim 88 wherein emphasis of at least one further criteria is increased so that clusters are formed from blocks which are more spatially fragmented but more closely follow an optimal extraction schedule.

90. (Previously Presented) The computer readable medium according to claim 88 wherein emphasis of at least one further criteria is decreased so the clusters are formed from blocks which are spatially compact but ignore an optimal extraction sequence.

91. (Previously Presented) The computer readable medium according to claim 85 comprising code for when the plurality of clusters have been defined, ordering the clusters in time and propagating the plurality of cones upwardly from each cluster in order of time, and wherein any blocks already assigned to a first cone are not included

in a second cone or any subsequent cone, and any blocks assigned to the second cone are not included in any subsequent cone and so-on.

92. (Previously Presented) The computer readable medium according to claim 85 further comprising code for controlling a size of each cluster to a predetermined size by reducing oversized clusters by reassigning blocks of that cluster according to their probability of belonging to other clusters.

REMARKS

Applicants propose to amend claim 85 so that it is consistent with claims 69 and 77 (as noted by the Examiner in her Interview Summary). Support for the amendment can be found at least at paragraph [0102] where it is described that "block model 601 … [are] is provided as input parameters".

The proposed amendment is needed to make clear the system and apparatus described in the specification and, in particular, that the block model may be provided to the data processing system that is used to process the blocks of the block model. For example, it is contemplated that the initial block model may have been calculated at a time different than the time at which the processing of the blocks of the block model occurs and may have been calculated on a different data processing system.

The proposed amendment does not require an additional search or examination and is patentable. As noted by the Examiner in her statement of reasons for allowance of claim 69, she indicates that it is the processing the blocks, forming a cone, and defining clumps of material that define the invention over the prior art. Thus, the proposed amendment does not affect the reasons for patentability. In addition, an additional search or examination is not required because, prior to the Examiner's amendment, the claim included at least forming a block model using the same or a different data processing system.

The amendment was not presented earlier because the potential scope of the amendment was not appreciated by the Applicants until the actual wording was set forth in

print in the Notice of Allowance and such was pointed out by the Examiner in her phone call of January 27, 2009. Moreover, it was not until the *In re Bilski* decision was rendered that the need for the Examiner's amendment was required.

In view of the above, Applicants believe that the proposed amendment is proper and respectfully request entry. If, for any reason, the Examiner needs to contact the undersigned attorney, I can be reached at (312) 321-4246.

Respectfully submitted,

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